

A STUDY ON PHYSICO-CHEMICAL CHARACTERISTICS OF DRINKING WATER AT VADUGAPATTI - THENI DISTRICT

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Abstract: This Paper Present to study of the Physico-chemical Parameters of drinking Water in Vadugapatti, Theni District, Tamilnadu. Monthly Changes in Physical and Chemical Parameters Such as Turbidity, Total Dissolved Solids, pH, Dissolved Oxygen, Free Carbon dioxide and Total Hardness, Chlorides, Alkalinity, Phosphate and Nitrates. Were analyzed for a periods of Three months from August 2007-October 2007. All Parameters were within the Permissible limits. The results indicate that the water is Non-polluted and can be used for Domestic, Irrigation and Pisciculture.

Key Words: Physico-Chemical Parameters, Monthly variation, surface water.

1. INTRODUCTION:

Natural resources are the important wealth of our country, water is one of them. Water is a wonder of the nature, “ No life without water “ is a common saying depending upon the fact that water is one of the naturally occurring essential requirement of all life supporting activities (Simpf et al., 2011). The important management of water system may cause serious problem in availability and quality of water. The Natural Aquatic Resources are causing Heavy and varied Pollution in aquatic Environment Leading to water Quality and Depletion of aquatic Biota. It is therefore Necessary that the Quality of Drinking water should be checked at regular time interval because due to use of Contaminated Drinking water (Trivedy et al., 1986).

Human Population Suffers a variety of Water Borne Diseases. It is difficult to understand The Biological Phenomena fully because the Chemistry of water reveals much about the Metabolism of the Ecosystem and explain the General Hydro Biological Relationship. The Physico-chemical parameters of water and the dependence of all life process of these factors make it desirable to take as an environment (Kodarker et al., 1992).

In Present Study involves the Analysis of Water Quality in Terms of Physico-chemical Parameters of surface water Theni District, Tamilnadu. The surface water is basically used for Domestic, Agriculture Purpose and Fisheries Activity. In India Still now several Researchers have done Study on Physicochemical and Biological characteristic of Standing and Running Water Resources.

2. MATERIALS AND METHODS:

Samples were collected in August 2007 to October 2007 and the sampling was done randomly from different locations at Vadugapatti. Two samples were collected from tube wells and pressure pumps. The sample collection was performed according to standard method given by APHA (2005). Samples were collected aseptically in 1 liter sterile autoclavable plastic (polypropylene) bottles and were transferred to the laboratory. The samples were air tight during the transportation to avoid further contamination. Physicochemical parameters such as colour, odour, turbidity, total dissolved solids, electrical conductivity, pH, total alkalinity, total hardness, calcium, magnesium, sodium, potassium, iron, ammonia, nitrite, nitrate, chloride, fluoride, sulphate, and phosphate contents were analysed by titrimetric methods in the laboratory following the standard methods as prescribed by APHA (2005).

Table 1. Physico-Chemical parameters in drinking water from S1 and S2

S.No	Parameters	August (2007)		September (2007)		October (2007)	
		S1	S2	S1	S2	S1	S2
1	TDS	830	440	945	485	1000	1000
2	EC	1185	625	1350	1350	1430	340
3	PH	7.0	7.14	7.15	7.49	7.39	7.85
4	Total Alkalinity	380	200	420	288	400	180
5	Iron	0.1	0.2	0.2	0.4	0.3	0.1
6	Nitrate	18	6	15	9	24	5
7	Chloride	140	40	150	40	200	40
8	Fluoride	0.4	0.2	0.70	0.55	0.80	0.5
9	Sulphate	0.08	0.04	50	10	70	12
10	Phosphate	0.04	0.04	0.05	0.08	0.04	0.04

All the parameters are expressed in mg/l, except P^H and EC (micro mhos/cm).

3. RESULTS AND DISCUSSION:

The physico-chemical assessment of drinking water were analysed during the period of August 2007 to October 2007. Table-1 shows the range of variation of physico-chemical parameters of water samples. The water samples were clear, colourless and odourless during the period of study.

P^H is a term used universally to express the intensity of the acid or alkaline condition of a solution. Most of the water samples are slightly alkaline due to presence of carbonates and bicarbonates. The pH values of water samples varied between 7.2 - 7.85 and were found slightly above the limit prescribed (WHO, 1993). Electrical conductivity (EC) is a measure of water capacity to convey electric current. It signifies the amount of total dissolved salts. EC values were in the range of 1430 micro-mhos/cm to 340 micro mhos/cm. High EC values were observed for two sampling points namely S1 and S2 indicating the presence of high amount of dissolved inorganic substances in ionized form in waters from Vadugapatti of Theni district. TDS has strongly positive relationship with Chloride indicated that dissolved solids mainly contained chloride ions. Strongly negative relationship between chloride and permanent hardness indicated in water sample present of chloride in lower amount and there is possibility of other ions like nitrate or sulphate in sample (Pathak *et al.*, 2011).

Water hardness is understood as a measure of the capacity of water to precipitate soap. The increase in the maximum level of total hardness is due to presence of carbonate and non carbonate compounds (Ramesh *et al.*, 2013). The total hardness is permanent in all the water samples (Manjare, *et al.*, 2010; Saravanakumar, K. *et al.*, 2011). The low concentration of iron in water affects target organs which are the thyroid gland, uterus and kidneys. Eating food or drink contaminated with large amounts of magnesium can cause stomach irritation. Extremely high magnesium exposure in children may affect brain development. Hence children may be more sensitive than adults (HPA 2010).

The amount of fluoride, nitrate, Sulphate and phosphate content in the sample were well within the permissible limits (Patil pandurang *et al.*, 2016). Results indicated that surface water sources of S2 sampling places is slightly contaminated with respected to given parameters during few analysis period, for remedial action, it may be suggested that the Municipal water quality of study area can be checked regularly. It may be concluded that sampling due to anthropogenic activities like lack of maintenance of pipelines.

4. CONCLUSION:

The major conclusions derived from this study, carried out in the Vadugapatti are as follows. The physical and chemical parameters of the Vadugapatti results shows that all the samples are under recommended limit for drinking purposes. On the basis of detailed chemical analysis, it may be suggested that the regular monitoring must needed for surface water supply of study area, quality can be checked effectively from the results of the present study, it may be said that, the overall surface water quality is chemically fit for domestic as well as drinking purpose.. The results of suitability evaluation that there is no major hazard in selected drinking water samples in Vadugapatti, Theni District of Tamilnadu.

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